

## CLASS XII – MATHEMATICS – CHAPTER 08

### APPLICATION OF INTEGRALS

Name:

Date:

- Q01.** Find the area of the region bounded by the curve  $y^2 = x$  and the lines  $x = 1$ ,  $x = 4$  and  $x$ -axis.
- Q02.** Find the area of the region bounded by  $y^2 = 9x$ ,  $x = 2$ ,  $x = 4$  and the  $x$  – axis in the first quadrant.
- Q03.** Find the area of the region bounded by the parabola  $y = x^2 + 1$  and the lines  $y = x$ ,  $x = 0$  and  $x = 2$ .
- Q04.** Find area of the region bounded  $x^2 = 4y$ ,  $y = 2$ ,  $y = 4$  and the  $y$  – axis in the first quadrant.
- Q05.** The area between  $x = y^2$  and  $x = 4$  is divided into equal parts by the line  $x = a$ , find the value of  $a$ .
- Q06.** Find the area of the region bounded by the parabola  $y = x^2$  and  $y = |x|$ .
- Q07.** Find the area of ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
- Q08.** Find the area bounded by the curve  $x^2 = 4y$  and the line  $x = 4y - 2$ .
- Q09.** Find the area bounded by the curves  $(x - 1)^2 + y^2 = 1$  and  $x^2 + y^2 = 1$ .
- Q10.** Find the area of the region bounded by the parabolas  $y^2 = 4ax$  and  $x^2 = 4ay$ ,  $a > 0$ .
- Q11.** Find the area of the region bounded by the curves  $y = x^2 + 2$ ,  $y = x$ ,  $x = 0$  and  $x = 3$ .
- Q12.** Find the area of the region  $\{(x, y) : x^2 \leq y \leq x\}$ .
- Q13.** Using integration, find the area of the region given:  $\{(x, y) : 0 \leq y \leq x^2 + 1, 0 \leq y \leq x + 1, 0 \leq x \leq 2\}$ .
- Q14.** Compute the area bounded by the lines  $x + 2y = 2$ ,  $y - x = 1$  and  $2x + y = 7$ .
- Q15.** Find Smaller area enclosed by the circle  $x^2 + y^2 = 4$  and the lines  $x + y = 2$ .
- Q16.** Find the area between the curves  $y = x$  and  $y = x^2$ .
- Q17.** Find the area of the smaller region bounded by the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  and the line  $\frac{x}{a} + \frac{y}{b} = 1$ .
- Q18.** Find the area of the region enclosed by the parabola  $x^2 = y$ , the line  $y = x + 2$  and the  $x$  – axis.
- Q19.** Using method of integration, find the area bounded by the curve  $|x| + |y| = 1$ .
- Q20.** Find area bounded by curves  $\{(x, y) : y = x^2 \text{ and } y = |x|\}$ .
- Q21.** Find the area of the region bounded by the ellipse  $\frac{x^2}{16} + \frac{y^2}{9} = 1$ .
- Q22.** Find the area of the region bounded by the ellipse  $\frac{x^2}{4} + \frac{y^2}{3} = 1$ .
- Q23.** Find the area of the region bounded by the curve  $y^2 = 4x$  and the line  $x = 3$ .
- Q24.** Find the area between the curve  $y = |x + 3|$ , the  $x$  – axis and the lines  $x = -6$  and  $x = 0$ .
- Q25.** Find the area bounded by the curves  $\{(x, y) : x^2 + y^2 \leq 2ax, y^2 > ax, a > 0, x > 0, y > 0\}$ .
- Q26.** Sketch the graph of  $y = |x + 3|$  and evaluate  $\int_{-6}^0 |x + 3| dx$ .

## DCA CLASSES

- Q27.** Find the area bounded by the curve  $y = \sin x$  between  $x = 0$  and  $x = 2\pi$ .
- Q28.** Using method of integration, find the area of the region bounded by lines:  
 $2x + y = 4$ ,  $3x - 2y = 6$  and  $x - 3y + 5 = 0$ .
- Q29.** Find the area of two regions  $\{(x, y) : y^2 \leq 4x, 4x^2 + 4y^2 \leq 9\}$ .
- Q30.** Prove the area of a circle of radius  $r$  is  $\pi r^2$  square units.
- Q31.** Find the area of the region in the 1<sup>st</sup> quadrant enclosed by  $x$  - axis and  $x = \sqrt{3}y$  by the circle  $x^2 + y^2 = 4$ .
- Q32.** Draw the graph of the curve  $y = \sqrt{9 - x^2}$  and find the area bounded by this curve and the coordinate axis.
- Q33.** Find the area of the smaller part of the circle  $x^2 + y^2 = a^2$  cut off by the line  $x = \frac{a}{\sqrt{2}}$ .
- Q34.** Find the area lying in the 1<sup>st</sup> quadrant and bounded by the circle  $x^2 + y^2 = 4$  and the lines  $x = 0$  and  $x = 2$ .
- Q35.** Find the Area of the region bounded by the curve  $y^2 = 4x$ ,  $y$  - axis and the line  $y = 3$ .
- Q36.** Find the area enclosed between the curve  $y = x^3$  and the line  $y = x$ .
- Q37.** Find the area of the circle  $4x^2 + 4y^2 = 9$  which is interior to the parabola  $y^2 = 4x$ .
- Q38.** Find the area of the region:  $\{(x, y) : x^2 + y^2 \leq 1 \leq x + y\}$ .
- Q39.** Draw a rough sketch of the region  $\{(x, y) : y^2 \leq 3x, 3x^2 + 3y^2 = 16\}$  and find the area enclosed by the region using method of integration.
- Q40.** Using integration find the area of the triangular region whose side have the equations  $y = 2x + 1$ ,  $y = 3x + 1$ , and  $x = 4$ .
- Q41.** Calculate the area of the region enclosed between the circles:  $x^2 + y^2 = 16$  and  $(x + 4)^2 + y^2 = 16$ .
- Q42.** Find the area enclosed by the parabola  $y^2 = 4ax$  and the line  $y = mx$ .
- Q43.** Find the area of the region  $\{(x, y) : 0 \leq y \leq (x^2 + 1), 0 \leq y \leq (x + 1), 0 \leq x \leq 2\}$ .
- Q44.** Find the area enclosed by the parabola  $4y = 3x^2$  and the line  $2y = 3x + 12$ .
- Q45.** Find the area of the smaller region bounded by the ellipse  $\frac{x^2}{9} + \frac{y^2}{4} = 1$  and the line  $\frac{x}{3} + \frac{y}{2} = 1$ .
- Q46.** Find the area of two regions  $\{(x, y) : y^2 \leq 4x, 4x^2 + 4y^2 \leq 9\}$ .
- Q47.** Find the area of the circle  $x^2 + y^2 = 15$  exterior to the parabola  $y^2 = 6x$ .
- Q48.** Find the area bounded by the  $y$  - axis,  $y = \cos x$  and  $y = \sin x$ ,  $0 \leq x \leq \frac{\pi}{2}$ .
- Q49.** Using integration, find the area of the region in the first quadrant enclosed by the  $x$  - axis, the line  $y = x$  and the circle  $x^2 + y^2 = 32$ .